such experiences his own metaphysical meanings, he is guilty of the metaphysician's *petitio*.

Much is said by Mr. Lovejoy about Mr. Dewey's phrase "present-as-absent" for the purpose of convincing the reader that it denotes a time-cognition; but no student of the psychology of time-cognition is convinced by these many animadversions. The term time-cognition denotes several different sorts of cognition. At the lowest it denotes an immediate sense of duration, of interruption; (2) it denotes the cognition of intervals or periods that must elapse ere the end of a desire is attainable; (3) it denotes a sense of the values of familiar experiences with no necessary consciousness of the pastness of those experiences; (4) it denotes an explicit consciousness of intervals of past experience; and (5) it denotes the highly abstract, prodigiously useful, public thing which we have called clock-time, mathematical time with its evenly flowing continuity marked by the recurring transits of a star, by the flow of sand in an hour glass, by the uniform rate of motion of hands round the dial of a clock, by the mathematical definition of continuous manifolds, and so forth. Until the metaphysical critic of pragmatism recognizes that genuine cognitions may involve any of these meanings of the term, or none of them, his criticisms are not likely to be helpful to the methodologist. The idea that psychology has nothing to say about time-cognition that concerns the metaphysician or the epistemologist is so deeply embedded,—the idea that psychology deals solely with a morass of subjectivity that philosophy is too pure to behold,—that it is difficult for some to understand the viewpoint and method of instrumentalism. Mr. Lovejoy fails to understand not only Mr. Dewey but the whole methodological approach to the problem of knowledge, and to understand that approach is, by your leave, the first indispensable step toward a real logic. Mr. Lovejoy finds the pragmatist to be a subjective idealist, a pan-objectivist, materialist, a dualistic interactionist, and above all an errorist; but the reader will search his criticisms in vain for even an approximately adequate exposition of the doctrine he is discussing.

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BOOK REVIEWS

Proceedings of the Aristotelian Society, 1920–1921. New Series, Vol. XXI. London: Williams and Norgate. Pp. iv + 246.

Part of the strength of the excellent series of papers which make

up the present volume is due to the contributions of the American delegates to the Oxford Congress. Professor W. P. Montague presented before the Aristotelian Society (meeting of December 6, 1920) a paper entitled "Variation, Heredity and Consciousness," embodying suggestions and hypotheses concerning the relation of life and mind to the realm of physical energy. He calls his argument "a mechanist answer to the vitalist challenge." In so obscure a field any hypothesis is worthy of a trial, provided it is at all capable of verification. The present reviewer finds it hard to decide whether or no the subtle analogies to which Professor Montague appeals do present sufficient possibilities of verification. Thus he compares biological variation to vector addition in mechanics, which gives from old elements a sum which is both pertinent and novel. It is a pretty analogy, but who shall say whether it is more? Furthermore, vector addition has already itself given certain mechanistically minded students of physics considerable occasion for perplexity, as for instance, addition of accelerations. And certainly the mechanist philosopher with a single-track mind would be a bit distressed by Professor Montague's remark that "Nature is not stone-blind . . . she is an artist who works as she goes." The next analogy, which claims indeed to be a full identity, is between heredity and higher space-time derivatives, accelerations of accelerations. The comparison is said to illustrate how a great complexity of promised movement can be resident in a single particle, or small group of particles of matter, which group is at the moment apparently quiescent, like an upward thrown stone at the top of its flight. So far the analogy holds good, but the reviewer can not make clear to himself how this explains anything more about heredity. To him, the very conception of an organism, a real unit in nature, going its own way, not merely self-preservative, but using, and in a measure dominating, its environment, seems inconsistent with strict mechanism—though, for that matter, no better explained by the ineffable mysteries of vitalism. In the third part of the paper, Professor Montague again takes up, in modified restatement, his earlier identification of consciousness with potential energy, an identification, it must be said, of the mysterious with the inscrutable. Yet the comparisons instituted are certainly tantalizing, and leave the reader wondering whether in the future some new road of investigation may not open up through this region—for it is a matter of fact that there are relationships of some sort between energy and thinking, and Professor Montague's guess is not the worst that has been made. Nevertheless, the members of the Aristotelian Society may well have been left with a state of

considerable stress and confusion inhabiting their own tanks of potential energy after the first hearing of this rather bewildering paper.

Professor J. E. Boodin's paper on "Cosmic Evolution" is less disturbing to customary ideas. His discussion centers about the opinions of L. J. Henderson, the physiological chemist (*e.g.*, his *The Fitness of the Environment*), and Henry F. Osborn, the biologist (in his *The Origin and Evolution of Life*). But back of this is a wider philosophic view: "We must learn that the cosmos is the true unit of reality," and further, "There must be an eternal hierarchy of levels in the universe." It would be hard to dispute that statements so general were not in some sense true.

Professor R. F. A. Hoernlé might perhaps also be claimed as an American contributor to this volume. His "Plea for a Phenomenology of Meaning" will receive the endorsement of all students in that subtle region. The reviewer would venture to suggest that Charles Peirce's cryptic classification of signs may best be interpreted as: (*a*) indices, or using what is naturally conjoined with another as the sign of it, as palm-trees in the desert are a sign of water; (*b*) icons, or signifying through resemblance, as a portrait or a map; and (*c*) signs whose original nexus with the thing symbolized has been obscured through use, so that the relation is now arbitrary and so needs an interpretant "who remembers what it meant." I point with my finger, it is an index; I draw a picture in the air to convey my meaning, it is an icon—in either case the whole world understands; I speak a word, it is what Peirce calls a symbol, and only my own people can interpret me. This third class is doubtless rather ill represented by the word "symbol." Professor Hoernlé is well advised in again calling attention to the distinction, so notable in the case of language, between the indicative and the expressive function of signs.[1] Perhaps the third class above could be revised, still with genuine regard to Peirce's own intention, to include all those signs whose most marked characteristic is this marriage of expression of intent and designation of fact. Language is here the typical case. To the extent to which the dictum is true—and it is only partly true—that "the real is particular, but thought is of the universal," this third class is also the marriage of the universal and particular. Indices move in the realm of particulars only. You can make general statements about indices, but each several index is, as such, individual and unique in itself and

[1] The author leaves one perplexed whether his terminology follows Husserl or Meinong here (p. 85, note). Surely Meinong's usage is preferable: I *express* my own opinions and feelings, I *indicate or designate* an external fact—and every sentence I speak does both at once.

in its reference. Icons are indeed in the realm of the universal, for a portrait designates an individual only in so far as that individual has ceased to be unique and is duplicated in the portrait itself. But the user of pictures does not clearly discriminate the universal, and picture language or imitative gesture is therefore but the beginning of true language. In true language the universal and the particular have each their distinctive part. Every dictionary word stands for a universal, yet through language we do manage to discuss the particular facts of this particular world round about us. But the other aspects of language must not be forgotten either, if we are to have an adequate theory. Language is, as Professor Hoernlé well insists, a double revelation; my language is a revelation of the world I know, but also it is a revelation of me. On the other hand, let us not forget that language is social, it is a revelation to somebody and needs an interpreter. It brings minds together, but it leaves them curiously isolated. For what does really pass across? Black marks visible on paper; quiverings of the air. Out of such things we each of us, a lonely worker, build a world, wherein we nevertheless meet our fellows and come to a knowledge of self and of others. Professor Hoernlé is right in saying we need to study these queer facts more closely.

Perhaps the reviewer, through personal interest in the problems raised, has given too much space to what our American delegates told the English about philosophy. Certainly he read with more than usual interest certain of the other papers, notably the Symposium on "The Character of Cognitive Acts." The most striking proposition here is that of Mr. G. E. Moore, to the effect that in all cognition, however simple, a particular, as for instance a sense datum, is subsumed under a universal, and that there is no other characteristic, such as the existence of a knower or an act of knowing, which is thus uniformly found. This thesis suggests that Mr. Moore is working towards a new theory of mind, and we await with interest its further development. The other symposium contributions offer little that is new, though they are acute and hold the attention.

The reviewer was less impressed by Dean Inge's Presidential Address, "Is the Time Series Reversible?" than he usually is by what the Dean writes on philosophy, though no one could help being amused by the parting shot at Einstein, "I feel in my bones that this prophet of relativity is not likely to be a true friend to Platonism." Mr. C. A. Richardson, in "The New Materialism," expresses his distaste for most of the New Realists, because they have done away with what a certain sophomore student of philosophy once called "the myself part of me." If the present reviewer got little

out of Miss Oakeley's paper on Professor Driesch, this is probably the reviewer's own fault, though it may be partly attributable to Professor Driesch.

There remain two logical papers. That by Mr. F. C. S. Schiller, "On Arguing in a Circle," is one of his chronic attacks on the Absolute, but it will probably awaken neither the Absolute nor his minions. Mr. Schiller has never equalled elsewhere his one really admirable logical paper, his contribution to Singer's *Studies in the History and Method of Science* (1917). Miss Dorothy Wrinch contributes a somewhat over-ambitious paper, at least as regards its title, "On the Structure of Scientific Inquiry." It contains many good things in matters of detail. Especially interesting is her treatment of what she calls "true analogy," or identity of form of solution in problems from otherwise different fields. One earlier passage deserves quotation in full. "The domain of logic in science is overwhelmingly wide and correspondingly difficult. No student who has any knowledge of the development of science can deny this. And yet the paramount importance of logic is very seldom realized and the study of it is quite often avoided and only infrequently undertaken by those who seek to make contributions to our knowledge of the world. Professor D'Arcy Thompson in the wonderful epilogue to *Growth and Form* (1917) hints at the æsthetic glories of such a treatment of the world, in words which are full of hope and encouragement, and should earn for him the gratitude of all logicians."

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JOURNALS AND NEW BOOKS

SCIENTIA. January, 1922. *Les sciences grecques et leur transmission. I. Splendeur et décadence de la science grecque* (pp. 1–10): J. L. HEIBERG (Kjöbenhavn).–Rapid historical sketch of Greek science. *The Origin of Binary Stars* (pp. 11–22): J. H. JEANS (Cambridge, England).–Concludes that some binaries are due to fission, others to independent nuclei in an original nebula. Interesting for its exposition of the methods by which these results were reached. *La contribution que les divers pays ont donnée au développement de la biologie* (pp. 23–36): MAURICE CAULLERY (Paris).–Largely a comparison of German scientific work with that of other countries, claiming to find in Germany excellent organization of research, but methods inclining towards a twisting of facts to fit *a priori* theories. *La question sociale* (pp. 37–46): *Vilfredo Pareto* (Lausanne).–Surveys the history of the conflict of social classes and